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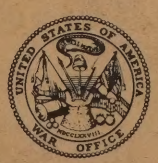
DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL
MAINTENANCE MANUAL

TEST SET, RADAR
AN/MPM-56



HEADQUARTERS, DEPARTMENT OF THE ARMY

NOVEMBER 1968

WARNING

Be careful when working on the 115-volt ac line connections. Serious injury or DEATH may result from contact with these terminals.

DON'T TAKE CHANCES!

TECHNICAL MANUAL
No. 11-6625-1755-12

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *29 November 1968*

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

TEST SET, RADAR AN/MPM-56

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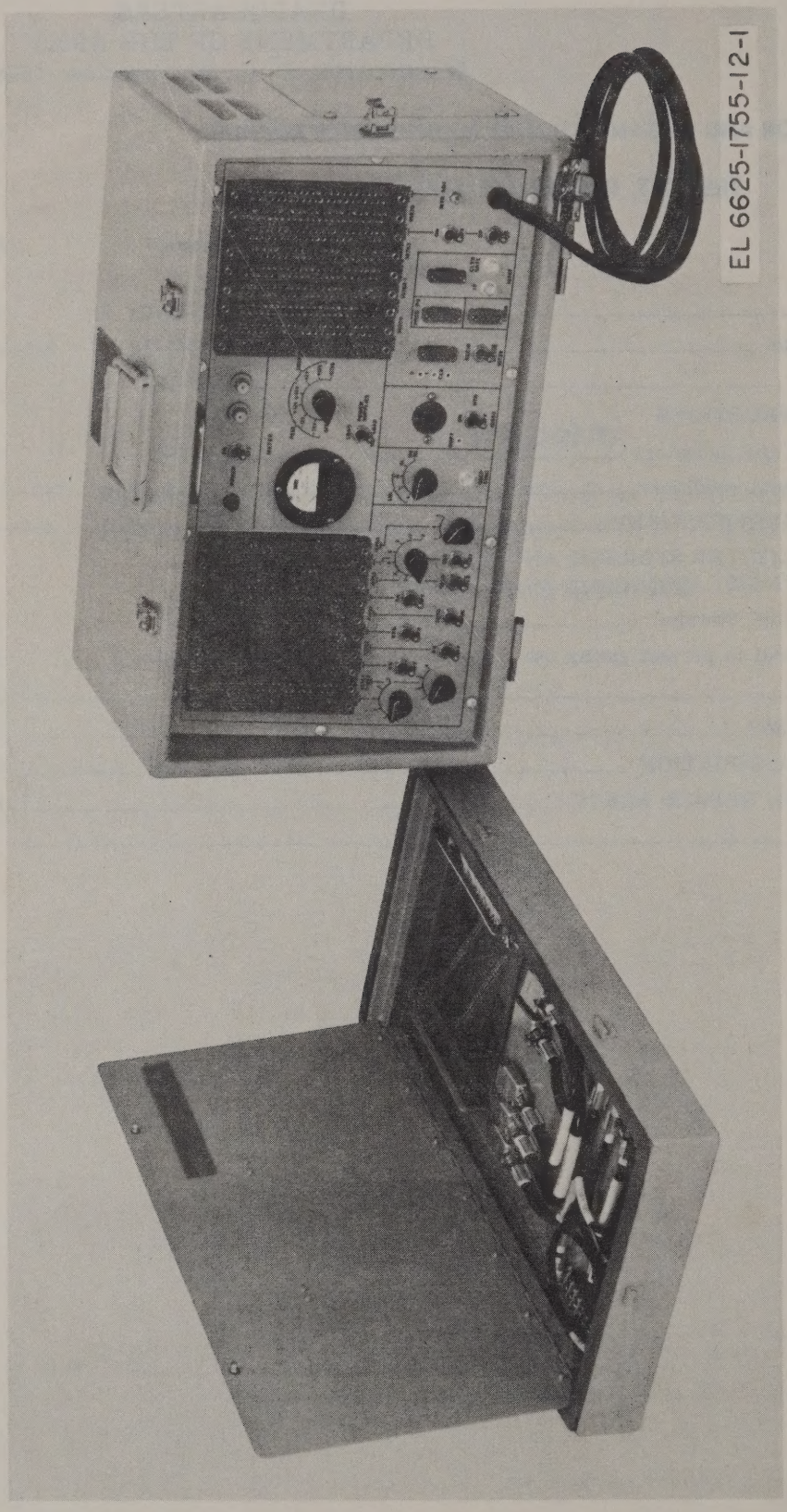

Figure 1–1. Test Set, Radar AN/MPM–56, bench test application.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Test Set, Radar AN/MPM-56 (fig. 1-1) and covers its installation, operation, and operator's and organizational maintenance. It includes operation under usual conditions, cleaning, and inspection of the equipment, and replacement of parts available to organizational maintenance personnel.

b. Appendixes B and C are current as of 27 August 1968.

1-2. Index of Publications

a. DA Pam 310-4. Refer to DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

1-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions given in TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as described in AR 700-58 (Army), NAVSUP Publication 378 (Navy), AFR 71-4 (Air Force), and MCO P4610-5 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army), NAVSUP Publication 459 (Navy), AFM 75-34 (Air Force), and MCO P4610.19 (Marine Corps).

d. Reporting of Equipment Manual Improvements. The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Publications) and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-ME-NMP-AD, Fort Monmouth, New Jersey, 07703.

Section II. DESCRIPTION AND DATA

1-4. Pupose and Use

The AN/MPM-56 is a portable maintenance facility designed to simplify testing and troubleshooting of Detecting Programming Group OA-7576/MPS-23A subassemblies by providing test signals to simulate, as closely as possible, actual signals present in the OA-7576/MPS-23A.

1-5. Technical Characteristics

Input Power	115-volts ac ±10%, 60 Hz ±15%, 0.5 ampere.
Internal dc voltages	+12 volts ±5%. -12 volts ±5%. +44 volts ±5%. -24 volts ±5%.
Internal oscillator frequency.	1 megahertz (MHz) ±10%.

Output signals to test subassemblies:	
Square waves	100 millisecond (ms) ±20% period, 10-volt ±20% amplitude.
	1-μsec ±20% period, 10-volt ±20% amplitude.
Pulses (3-ms ±20% period).	10-μsec ±20% width, 10-volt ±20% amplitude.
	5-μsec ±20% width, 10-volt ±20% amplitude.
	1-μsec ±20% width, 10-volt ±20% amplitude.
	500-μsec ±20% width, 10-volt ±20% amplitude.
	10-μsec ±20% width, 28-volt ±20% amplitude.
Additional pulses	0.17-μsec ±20% width, 1-μsec ±20% period, 10-volt ±20% amplitude.
	1-μsec ±20% width, 6-μsec ±20% period, 10-volt ±20% amplitude.
Additional signals	300-μsec ±100 ramp, 3-ms ±20% period, 7-volt ±1 amplitude.
	10-μsec ±20% burst, 21.6-MHz RF frequency, 3-ms ±20% period.
Environmental requirements:	
Operating temperature range.	+50° F to 100° F.
Storage temperature range.	–80° F to +160° F.
Operating relative humidity range.	Up to 97% without condensation.
Non-operating relative humidity range.	Up to 100% with condensation.
Operating altitude range.	Up to 10,000 ft above sea level.
Non-operating altitude range.	Up to 25,000 ft above sea level.
Operating orientation range.	Up to 20° from normal operating position.
Non-operating orientation range.	Any position.

1–6. Components of AN/MPM–56
(figs. 1–1 and 1–2)

Note. Refer to the basic issue items list (app B) for an official listing of components.

a. Components.

Quantity	Item	Dimensions (in.) Height	Depth	Width	Unit Weight (lb)
1	Test Set, Radar TS–2780/MPM–56	13	13	22	55
1	Cable Assembly, Special Purpose, Electrical CX–11834/MPM–56 (W1).	14			
1	Cable Assembly, Special Purpose, Electrical CX–11835/MPM–56 (W4).	14			
1	Cable Assembly, Special Purpose, Electrical CX–11836/MPM–56 (W5).	14			
1	Cable Assembly, Special Purpose, Electrical CX–11837/MPM–56 (W6).	14			
2	Cable Assembly, Radio Frequency CG–1464B/U (1 ft 2 in.) (W2, W3).	14			
1	Cable Assembly, Radio Frequency CG–1464B/U (2 ft 2 in.) (W7).	26			
1	Extender, Circuit Card MX–8258/MPM–56	6 1/2	1 3/4	8 1/4	1

b. Running Spares.

Quantity	Item	Part No.
1	Crystal	SM–B–374216
1	Lamp	MS25252 NE–2D
1	Relay	SM–B–443626
5	Fuse 1A	F01A125V1A
5	Fuse 2A	F01A125V2A

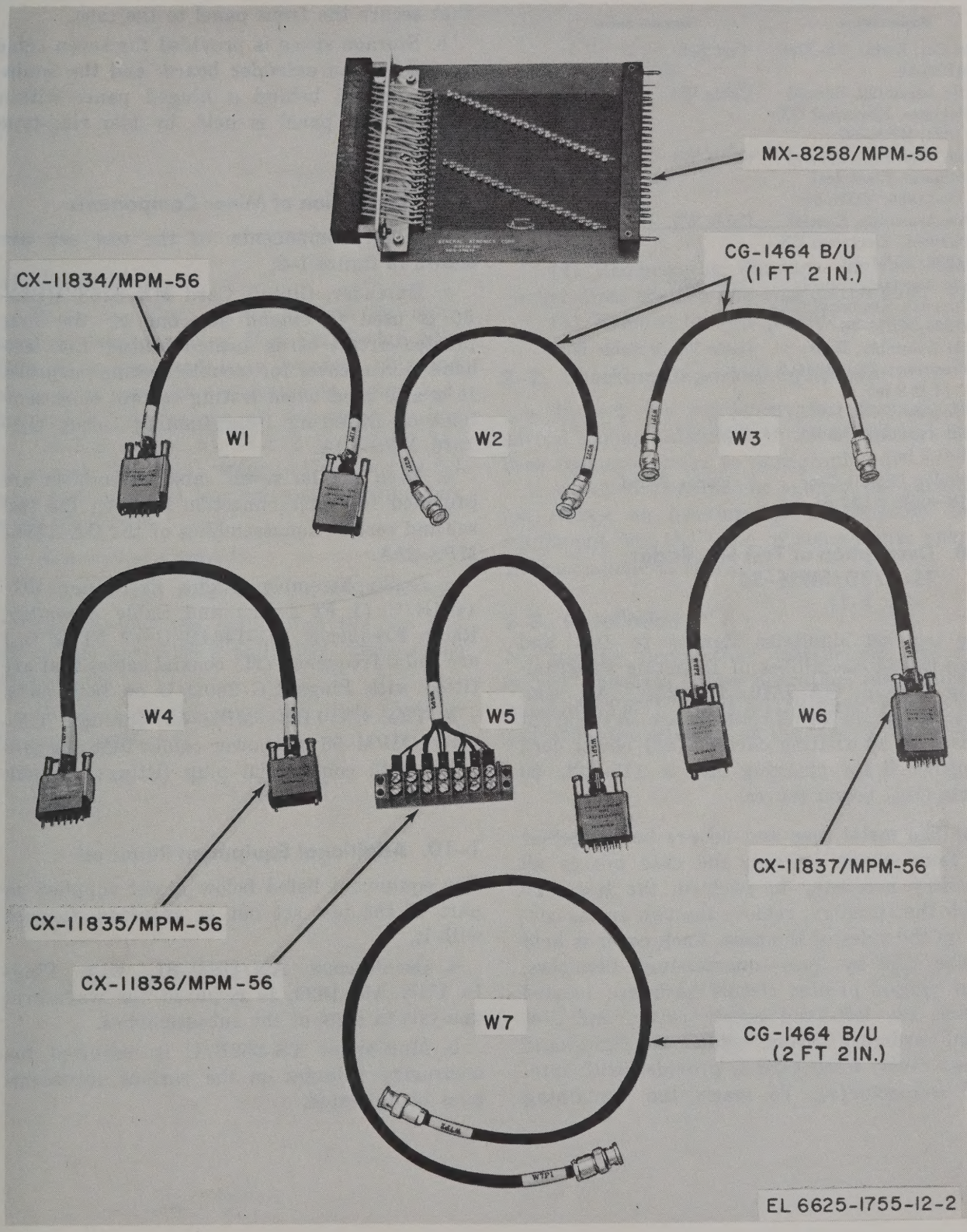

Figure 1-2. Component Test Set, Radar AN/MPM-56, extender board and cables.

1–7. Common Names

Nomenclature	Common name
Test Set, Radar TS–2780/MPM–56.	Test Set.
Cable Assembly, Special Purpose, Electrical CX–11834/MPM–56.	Cable W1.
Cable Assembly, Special Purpose, Electrical CX–11835/MPM–56.	Cable W4.
Cable Assembly, Special Purpose, Electrical CX–11836/MPM–56.	Cable W5.
Cable Assembly, Special Purpose, Electrical CX–11837/MPM–56.	Cable W6.
Cable Assembly, Radio Frequency CG–1464B/U (1 ft 2 in). Frequency CG–1464B/U	Cable W2 or Cable W3.
Cable Assembly, Radio (2 ft 2 in.).	Cable W7.
Extender, Circuit Card MX–8258/MPM–56.	Extender Board.

1–8. Description of Test Set, Radar TS–2780/MPM–56 (fig. 1–1).

The test set simulates signals to test and align the subassemblies of Detecting Programming Group OA–7576/MPS–23A. All connectors and operating controls are on the front panel. An alternating current (ac) power cord is provided for plugging into a 115-volt, 60 Hertz (Hz) power source.

a. The metal case and lid are held together by four spring latches; the case houses all circuitry necessary to perform the tests. To reach the circuitry, remove the two access covers on the sides of the case. Each cover is held to the case by four quarter-turn fasteners. Four plug-in printed circuit cards are located behind the left-hand access cover, and five metal cards are located behind the right-hand access cover. Each card is provided with integral connector(s). To reach the remaining circuitry, remove the ten quarter-turn fasteners that secure the front panel to the case.

b. Storage space is provided for seven cable assemblies, an extender board, and the equipment manual behind a hinged panel within the lid. The panel is held by two ring-type fasteners.

1–9. Description of Minor Components

The minor components of the test set are shown in figure 1–2.

a. Extender, Circuit Card MX–8258/MPM–56 is used to extend any one of the four printed-circuit cards located behind the left-hand access cover for troubleshooting purposes. It is also used when testing certain subassemblies of Detecting Programming Group OA–7576/MPS–23A.

b. Each of the seven cable assemblies are provided for interconnection between the test set and certain subassemblies of the OA–7576/MPS–23A.

c. Cable Assembly, Radio Frequency CG–1464B/U (1 Ft 2 In.) and Cable Assembly, Radio Frequency CG–1464B/U (2 Ft 2 In.) are radio frequency (rf) coaxial cables that are fitted with Plugs UG–260D/U on both ends.

d. The CX–11834/MPM–56 through CX–11837/MPM–56 are power cables that are provided with commercial plug fittings on both ends.

1–10. Additional Equipment Required

The equipment listed below is not supplied as part of the test set but is required for use with it.

a. Oscilloscope AN/USM–81, with Plug-In Unit AM–1839, is required for waveform analysis in tests of the subassemblies.

b. Multimeter TS–352B/U is required for measuring voltages on the various subassemblies being tested.

CHAPTER 2

INSTALLATION

2-1. Unpacking

a. Packaging Data. When packed for shipment, the components of Test Set, Radar AN/MPM-56 are packed in a wooden shipping box and its contents are shown in figure 2-1. The outside dimensions of the shipping box are: 24-1/2 inches by 16-1/2 inches by 15-1/2 inches. The total volume of the box is 3.4 cubic feet, and the test set and shipping box weigh 65 pounds.

b. Removal of Contents.

(1) Cut and fold back the metal straps.

(2) Remove the nails from the top and side of the box with a nailpuller. Remove the top and side.

(3) Remove the small box that contains the spare parts.

(4) Remove the dunnage and/or foam rubber from the top and side of the unit.

(5) Remove the equipment.

2-2. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, refer to paragraph 1-3.

b. Check the equipment against the packing list. When no packing list accompanies the equipment, use the table of components (para 1-6) as a general check.

2-3. Installation

No specific installation instructions are required; however, before operation, mechanically set the TEST INDICATOR meter to zero by adjusting the setscrew on the face of the meter.

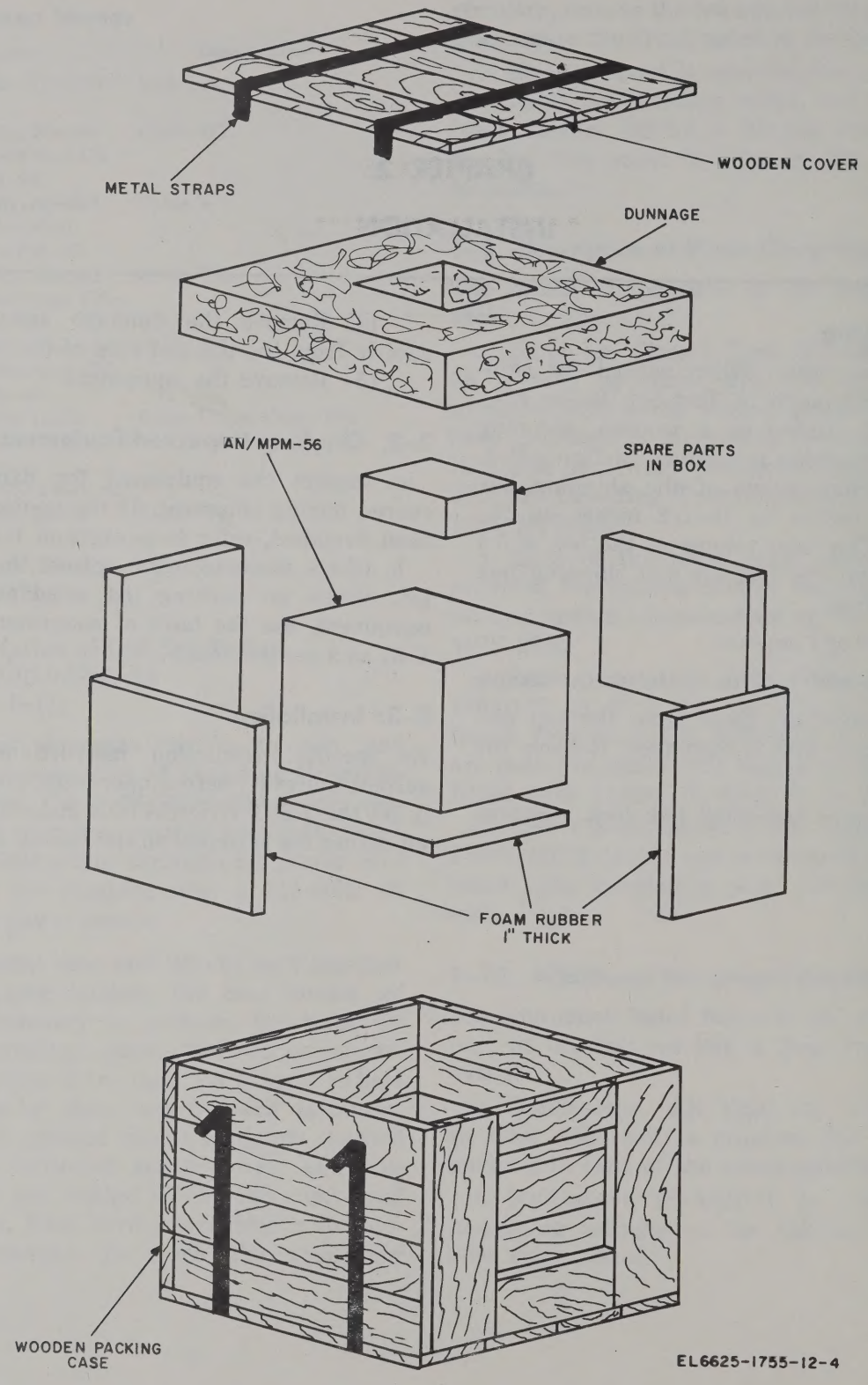

Figure 2-1. Packaging diagram.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. OPERATOR'S CONTROLS AND INDICATORS

3–1. General

The operator's controls and indicators on the front panel of the test set, and their functions, are given in paragraph 3–2.

3–2. Test Set, Radar TS–2780/MPM–56, Operating Controls, Indicators, and Connectors (fig. 3–1)

Control, indicator, or connector	Sw pos	Function
POWER switch	ON	Applies 115-volt, ac input power to test set.
	OFF	Deenergizes test set.
POWER indicator light (red)		Indicates test set is being energized by 115- volt ac input power.
METER switch		Selects appropriate OA–7576/MPS–23A subassembly to be monitored by TEST INDICATOR meter.
	Sw pos	Action
	OFF	Disconnects TEST INDICATOR meter from monitoring all subassemblies, and places short across TEST INDICATOR meter terminals.
	PRSD –24V	Connects TEST INDICATOR meter to monitor assembly MS241S (–24–volt power supply).
	PRSD –12V	Connects TEST INDICATOR meter to monitor assembly MS124L (–12-volt power supply).
	PRSD +12V	Connects TEST INDICATOR meter to monitor assembly MS121G (+12-volt power supply).

Control, indicator, or connector	Function	
	Sw pos	Action
	PRSD +44V	Connects TEST INDICATOR meter to monitor assembly MS45P5 (+44-volt power supply).
	11059 –12V	Connects TEST INDICATOR meter to monitor –12-volt power supply of assembly 11059.
	11059 +12V	Connects TEST INDICATOR meter to monitor +12-volt power supply of assembly 11059.
	10759	Connects TEST INDICATOR meter to assembly 10759 to simulate GO-NO-GO meter.
POWER SUPPLIES switch	NO LOAD	Enables TEST INDICATOR meter to monitor power supply assemblies of OA–7576/MPS–23A under no-load conditions.
	LOAD	Enables TEST INDICATOR meter to monitor power supply assemblies of OA–7576/MPS–23A under rated load conditions.
OSCP SYNC connector		Selects signal from test set used to trigger oscilloscope through OSCP SYNC jack and cable W7.
OSCP SYNC switch	Sw pos	Action
	3MS +	Selects positive-going edge of 3-ms multivibrator pulse to trigger oscilloscope.
	3MS –	Selects negative-going edge of 3-ms multivibrator pulse to trigger oscilloscope.
	3MS	Selects negative-going edge of 3-ms multivibrator pulse delayed by 500 usec to trigger oscilloscope.
	DL	Selects pulse used to test delay line to trigger oscilloscope. This pulse is 1 microsecond wide and 12 volts in amplitude, and occurs every 6 microseconds.
	100 MS	Selects edge of 100-ms multivibrator pulse to trigger oscilloscope.

Control, indicator, or connector	Function
10880 (octal socket)	Provides required voltages and terminations to enable testing of crystal oscillator assembly 10880.
HTR switch	Sw pos: ON — Action: Provides 115-volts ac to heater of assembly 10880.
	Sw pos: OFF — Action: Disconnects 115-volts ac from heater of assembly 10880.
OUPT test jack	Provides connection for monitoring output of assembly 10880.
10728 connector	Provides connection of cable W4 to delay line assembly 10728–1, –2, –3, or –4.
0 test jack	Provides connector for monitoring logical zero (0) input to delay line.
1 test jack	Provides connection for monitoring logical one (1) input to delay line.
CLK test jack	Provides connection for monitoring clock input to delay line.
RECIR-$\overline{\text{RECIR}}$ switch	Sw pos: RECIR — Action: Enables output signal from delay line to recirculate back to input of delay line.
	Sw pos: $\overline{\text{RECIR}}$ — Action: Disables output signal from recirculating back to input of delay line.
PRSD PS connector	Provides for connection of cable W5 to power supply assemblies MS241S, MS124L, MS121G, and MS45P5.
11059 connector	Provides for connection of cable W6 to power supply assembly 11059.
10747 connector	Provides for connection of cable W1 to IF amplifier assembly 10747–J4.
IF connector	Provides for connection of cable W2 to IF amplifier assembly 10747–J1.
CLTR GATE connector	Provides for connection of Cable W3 to IF amplifier assembly 10747–J3.
10748 connector	Provides necessary voltages, signals, and terminations to enable testing of video selector assembly 10748.
Five-position rotary switch (below 10748 connector)	Selects simulated input applied to video selector assembly 10748.
	Sw pos: 1 — Action: Selects simulated normal video pulse.
	Sw pos: 2 — Action: Selects simulated test target pulse.
	Sw pos: 3 — Action: Selects simulated go/no-go test target pulse.
	Sw pos: 4 — Action: Selects simulated dicke fix video pulse.
	Sw pos: 5 — Action: Selects simulated wide video pulse to test fast time constant (ftc)

Control, indicator, or connector	Function	
	Sw pos	Action
		portion of assembly 10748.
10764–11012 connector		Provides necessary voltages, signals, and terminations to enable testing of NOR gate assembly 10746, or power NOR gate assembly 11012.
Four-position rotary switch (below 10764/11012 connector).		Selects particular diode to be tested from complement of four input diodes.
10749 connector		Provides necessary voltages, signals, and terminations to enable testing of anti-wildcat assembly 10749.
	Sw pos	Action
ON-OFF switch (below 10749 connector)	ON	Provides input pulse of sufficient amplitude to turn anti-wildcat circuitry on.
	OFF	Input pulse decreases in amplitude preventing turn-on of anti-wildcat circuitry.
10752 connector		Provides necessary voltages, signals, and terminations to enable testing of test target assembly 10752.
	Sw pos	Action
ON-OFF switch (below 10752 connector)	ON	Energizes relay on assembly 10752.
	OFF	Deenergizes relay on assembly 10752.
10753 connector		Provides necessary voltages, signals and terminations to enable testing of A/D converter assembly 10753.
	Sw pos	Action
GRD switch (below 10753 connector)	GRD (up)	Simulates ground level from delay line output (dlo) disabling output flip-flop.
	Center	Enables output flip-flop.
	GRD (down)	Simulates ground level from height-to-width converter output disabling output flip-flop.
11001 connector		Provides necessary voltages, signals, and terminations to enable testing of output generator assembly 11001.
	Sw pos	Action
AUTO-MAN switch	AUTO	Simulates RING target switch on Radar Test Target Generator SG–630/MPS–23A being turned on.
	CENTER	Simulates both RING and SINGLE target switches on Radar Test Target Generator SG–630/MPS–23A being turned on.

Control, indicator, or connector	Function	
	Sw pos	Action
	MAN	Simulates SINGLE target switch on Radar Test Target Generator SG–630/MPS–23A being turned on.
10756 connector	Provides necessary voltages, signals, and terminations to enable testing of interface relay assembly 10756.	
	Sw pos	Action
ON-OFF switch (below 10756 connector)	ON	Energizes all relays on assembly 10756.
	OFF	Deenergizes all relays on assembly 10756.
10755 connector	Provides necessary voltages, signals, and terminations to enable testing of interface assembly 10755.	
	Sw pos	Action
HOLD-$\overline{\text{HOLD}}$ switch	HOLD	Simulates HOLD signal to assembly 10755.
	$\overline{\text{HOLD}}$	Simulates $\overline{\text{HOLD}}$ signal to assembly 10755.
10758 connector	Provides necessary voltages, signals, and terminations to enable testing of GO/NO-GO No. 1 Assembly 10758.	
Eight-position rotary switch (below 10758 connector)	Selects a particular diode to be tested from complement of eight input diodes.	
	Sw pos	Action
GRD/–12V switch	GRD	Applies ground to diode under test.
	Center	Disables ground or –12 volts from being applied to diode under test.
	–12V	Applies –12 volts dc to diode under test.
10750 connector	Provides necessary voltages, signals, and terminations to enable testing of peak detector assembly 10750.	
Three-position rotary switch (below 10750 connector).	Selects amplitude of simulated video pulse input.	
	Sw pos	Action
	1	Selects 1-volt input pulse.
	4	Selects 4-volt input pulse.
	7	Selects 7-volt input pulse.
10751 connector	Provides necessary voltages and terminations to enable testing of height-to-width converter assembly 10751. This assembly must be tested with assembly 10750 plugged into 10750 connector.	
10760 connector	Provides necessary voltages, signals, and terminations to enable testing of GO/NO-GO No. 3 assembly 10760.	
10761 connector	Provides necessary voltages, signals, and terminations to enable testing of diode gate assembly 10761.	
10762–1 connector	Provides necessary voltages, signals, and terminations to enable testing of flip-flop assembly 10762 in set-reset configuration.	

Control, indicator, or connector	Function
10762–2 connector	Provides necessary voltages, signals, and terminations to enable testing of flip-flop assembly 10762 in binary counter configuration.
10763 connector	Provides necessary voltages, signals, and terminations to enable testing of emitter follower assembly 10763.
10757 connector	Provides necessary voltages, signals, and terminations to enable testing of video gate assembly 10757.
ON-OFF switch (below 10757 connector)	Simulates PRSD ON-OFF switch on OA–7576/MPS–23A control panel.
	Sw pos: ON — Action: Simulates PRSD switch set to ON.
	Sw pos: OFF — Action: Simulates PRSD switch set to OFF.
OP-$\overline{OP}$ switch	Simulates operate gate logic signal.
	Sw pos: OP — Action: Simulates operate gate being a logical one.
	Sw pos: $\overline{OP}$ — Action: Simulates operate gate being a logical zero.
10870 connector	Provides necessary voltages, signals, and terminations to enable testing of NAND gate assembly 10870.
10759 connector	Provides necessary voltages, signals, and terminations to enable testing of GO/NO-GO No. 2 assembly 10759.
MTR ADJ control	Simulates CAL ADJ control on OA–7576/MPS–23A GO/NO-GO panel.

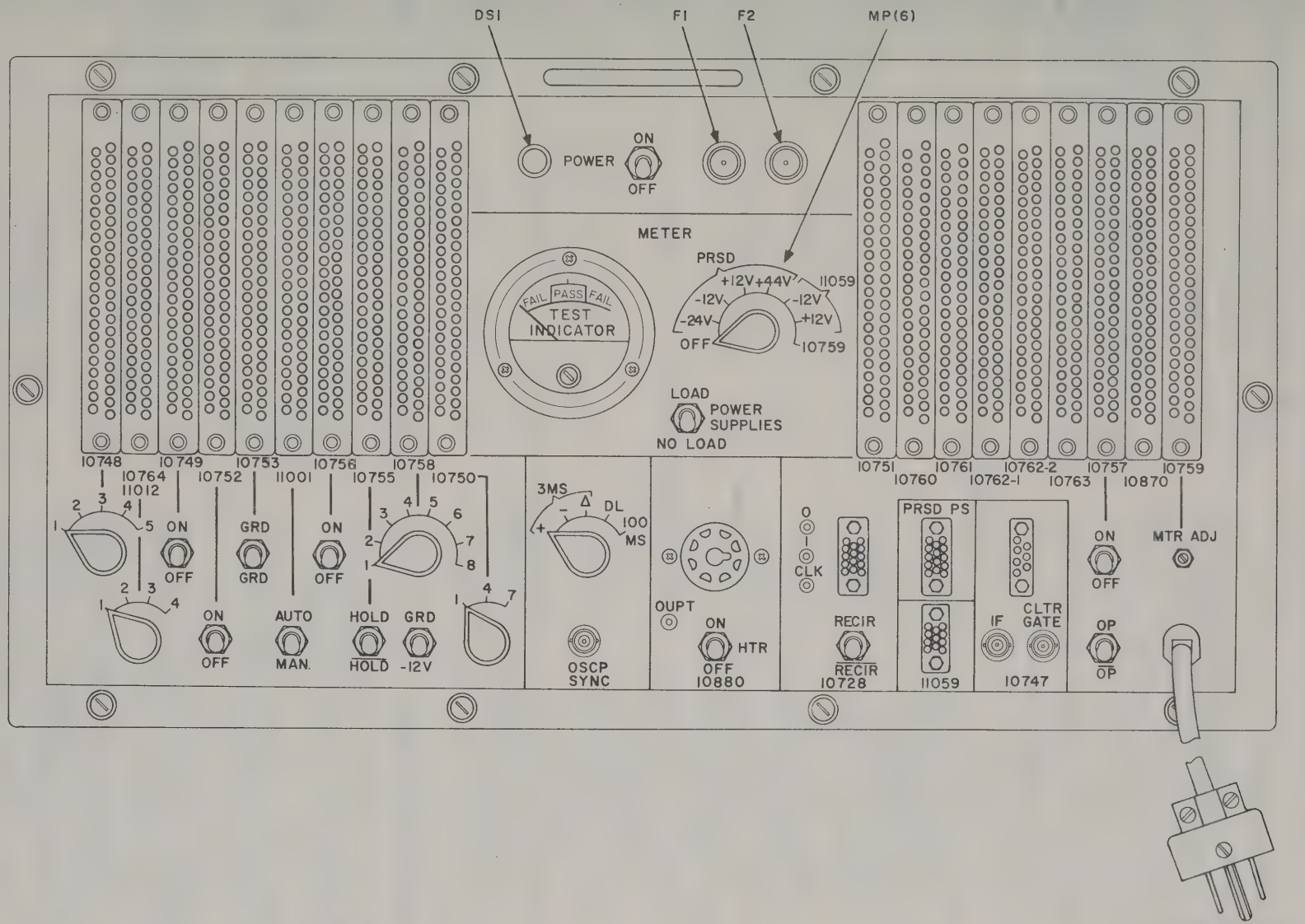

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Figure 3–1. Test Set, Radar TS–2780/MPM–56, controls, indicators, and connectors.

Section II. OPERATION UNDER USUAL CONDITIONS

3–3. Types of Operation

a. The AN/MPM–56 is operated in a variety of ways to simulate and align various subassemblies of Detecting Programming Group OA–7576/MPS–23A.

b. For any type of operation, perform the procedures given below:

(1) Preliminary procedures (para 3–4).

(2) Starting procedure (para 3–5).

(3) Procedure for the desired type of operation (para 3–6 through 3–27).

(4) Stopping procedure (para 3–28).

Note. Selection of the appropriate cable assembly listed in the chart below enables interconnection to be made between the test set and certain subassemblies of the OA–7576/MPS–23A. The correct cable connections are given in the test procedures.

Ref desig.	Name	OA–7576/MPS–23A Assy and connector	Test set connector
W1	Cable Assembly, Special Purpose, Electrical CX–11834/MPM–56.	10747–J4	10747
W2	Cable Assembly, Radio Frequency CG–1464B/U (1 ft 2 in.).	10747–J1	IF
W3	Cable Assembly, Radio Frequency CG–1464B/U (1 ft 2 in.).	10747–J3	CLTR GATE
W4	Cable Assembly, Special Purpose, Electrical CX–11835/MPM–56.	10728–1, –2, –3, and –4.	10728
W5	Cable Assembly, Special Purpose, Electrical CX–11836/MPM–56.	MS45P5, MS121G, MS124L, and MS241S.	PRSD PS
W6	Cable Assembly, Special Purpose, Electrical CX–11837/MPM–56.	11059–J1	11059
W7	Cable Assembly, Radio Frequency CG–1464B/U (2 ft 2 in.).	OSCILLOSCOPE TRIGGER INPUT.[a]	OSCP SYNC

[a] Located on AN/USM–81 external oscilloscope.

3–4. Preliminary Procedures

Perform the preliminary operations listed below before starting the equipment as described in paragraph 3–5.

a. Before installing or removing any assembly to be tested, set the POWER switch to OFF.

b. Connect cable W7 between the test set set OSCP SYNC connector and the AN/USM–81 TRIGGER INPUT connector.

c. Set the OSCP SYNC switch to the position indicated at the beginning of each test described in the test procedures.

d. Set all rotary switches fully counterclockwise.

e. Set all two-position toggle switches to down position, and the three-position toggle switches to center position.

3–5. Starting Procedures

Before starting the equipment, check to see that the controls are set as required by the preliminary procedures described in *a*, *b*, and *c* below.

a. Connect the power input cord on the front panel to a 115-volt, 60-Hz power source.

b. Set the POWER switch to ON.

c. Observe that red POWER indicator is lighted.

3–6. Power Supply Test

The test set supplies the necessary power to any of the four OA–7576/MPS–23A or the two Radar Test Target Generator SG–630/MPS–

23A power supplies. The power supplies are tested under no load or full load by applying internal load resistors adjusted to draw rated current from the power supplies.

a. +44-Volt Power Supply (MS45PS) Test.

(1) Connect cable W5 between the PRSD PS connector and the power supply.

(2) Set the LOAD-NO LOAD switch to NO LOAD.

(3) Turn the METER switch to PRSD +44V.

(4) Set the POWER switch to ON.

(5) Check to see that the TEST INDICATOR meter reads in PASS area.

(6) Set the LOAD-NO LOAD switch to LOAD.

(7) Check to see that the TEST INDICATOR meter reads in PASS area.

b. +12-Volt Power Supply (MS121G) Test.

(1) Connect cable W5 between the PRSD PS connector and the power supply.

(2) Set LOAD-NO LOAD switch to NO LOAD.

(3) Turn the METER switch to PRSD +12V.

(4) Set the POWER switch to ON.

(5) Check to see that the TEST INDICATOR meter reads in PASS area.

(6) Set the LOAD-NO LOAD switch to LOAD.

(7) Check to see that the TEST INDICATOR meter reads in PASS area.

c. -12-Volt Power Supply (MS124L) Test.

(1) Connect cable W5 between the PRSD PS connector and the power supply.

(2) Set the LOAD-NO LOAD switch to NO LOAD.

(3) Turn the METER switch to PRSD -12V.

(4) Set the POWER switch to ON.

(5) Check to see that the TEST INDICATOR meter reads in PASS area.

(6) Set the LOAD-NO LOAD switch to LOAD.

(7) Check to see that the TEST INDICATOR meter reads in PASS area.

d. -24-Volt Power Supply (MS241S) Test.

(1) Connect cable W5 between the PRSD PS connector and the power supply.

(2) Set the LOAD-NO LOAD switch to NO LOAD.

(3) Turn the METER switch to PRSD -24V.

(4) Set the POWER switch to ON.

(5) Check to see that the TEST INDICATOR meter reads in PASS area.

(6) Set the LOAD-NO LOAD switch to LOAD.

(7) Check to see that the TEST INDICATOR meter reads in PASS area.

e. SG-630/MPS-23A Power Supply (11059) Test.

(1) Connect cable W6 between the 11059 connector and the power supply.

(2) Set the LOAD-NO LOAD switch to NO LOAD.

(3) Turn the METER switch to 11059 +12V.

(4) Set the POWER switch to ON.

(5) Check to see that the TEST INDICATOR meter reads in PASS area.

(6) Set the LOAD-NO LOAD switch to LOAD.

(7) Check to see that the TEST INDICATOR meter reads in PASS area.

(8) Turn the METER switch to 11059 -12V.

(9) Check to see that the TEST INDICATOR meter reads in PASS area.

(10) Set the LOAD-NO LOAD switch to NO LOAD.

(11) Check to see that the TEST INDICATOR meter reads in PASS area.

3-7. Crystal-Controlled Oscillator Assembly 10880 Test

The crystal-controlled oscillator from the OA-7576/MPS-23A can be tested both with and without the oscillator heater energized. Frequency is measured on the oscilloscope.

a. Plug the oscillator into the test set 10880 socket.

b. Set the POWER switch to ON.

c. Monitor the oscilloscope OUPT test point for a waveform as shown in figure 3-2.

d. Set the HTR switch to ON.

e. Check to see that the waveform is same as that shown in figure 3-2.

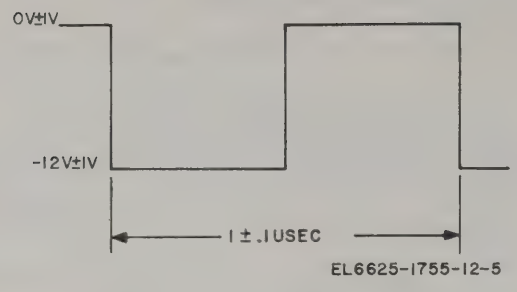

Figure 3-2. Waveform for assembly 10880.

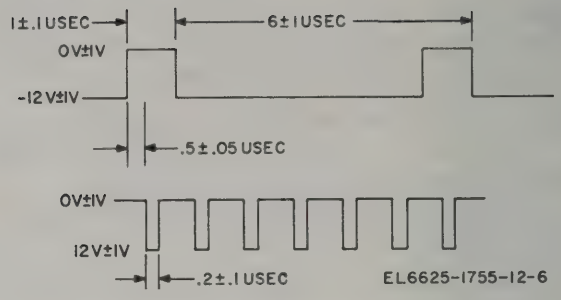

Figure 3-3. Waveform for assembly 10728.

3-8. Delay Line Assemblies (107280-1, -2, and -4) Test

a. Pulses derived from the crystal-controlled oscillator built into the test set are used in testing and aligning the delay lines. The length of each delay line is shown in the chart below:

Part No.	Length (usec)
10728-1	210
10728-2	420
10728-3	840
10728-4	1680

b. A typical test of a delay line is as follows:

(1) Turn the OSCP SYNC switch to DL.

(2) Connect cable W4 between the test set 10728 connector and the delay line.

(3) Set the POWER switch to ON.

(4) Monitor 1 and CLK test jacks on the test set.

(5) Adjust the screw on the delay line for waveforms as shown in figure 3-3.

(6) Set the RECIR-$\overline{\text{RECIR}}$ switch to RECIR.

(7) Check to see that the waveforms are same as those shown in figure 3-3.

3-9. IF Amplifier Assembly 10747 Test

Preliminary alignment or IF amplifier assembly 10747 is accomplished with the test set which produces internally generated, pulse-modulated continuous wave (cw) signals. This signal simulates the actual intermediate frequency (IF) input.

a. Turn the OSCP SYNC switch to 3MS+.

b. Connect cable W1 between the test set 10747 connector and connector J4 on the IF amplifier assembly.

c. Connect cable W2 between the test set IF connector and J1 on the IF amplifier assembly.

d. Connect cable W3 between the test set CLTR GATE connector and J3 on the IF amplifier assembly.

e. Set the POWER switch to ON.

f. Monitor TP1 on the IF Amplifier with the oscilloscope.

g. Check to see that the waveform is as shown in figure 3-4.

3-10. NOR Gate Assembly 10764 and Power NOR Gate Assembly 11012

The test set simulates OA-7576/MPS-23A input pulses to all eight gates at one time. Also, the use of a rotary switch on the test set front panel makes it possible to check all input diodes.

a. Turn the OSCP SYNC switch to DL.

b. Plug NOR Gate assembly 10764 into the test set 10764-11012 connector.

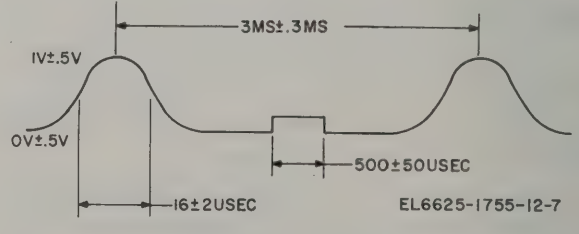

Figure 3-4. Waveform for Assembly 10747.

c. Set the POWER switch to ON.

d. Turn the four-position rotary switch (below 10764C/11012 connector) to 1.

e. With the oscilloscope, monitor TP3 through TP10 on the NOR gate assembly.

f. Check to see that the waveforms are as shown in figure 3–5.

g. Turn the four-position rotary switch to 2.

h. Repeat *e* and *f* above.

i. Turn the four-position rotary switch to 3.

j. Repeat *e* and *f* above.

k. Turn the four-position rotary switch to 4.

l. Repeat *e* and *f* above.

m. Perform procedures given in *a* through *l* above to test power NOR gate assembly 11012.

3–11. Emitter Follower Assembly 10763 Test

Sixteen emitter followers are checked in parallel by the test set which applies simulated OA–7567/MPS–23A loaded signals to detect base-to-emitter short circuits.

a. Turn the OSCP SYNC switch to DL.

b. Plug emitter follower assembly 10763 into the test set 10763 connector.

c. Set the POWER switch to ON.

d. Monitor TP1 through TP16 on emitter follower assembly 10763 with the oscilloscope.

e. Check to see that the waveform at each test point is as shown in figure 3–6.

3–12. Video Selector Assembly 10748 Test

The test set applies simulated OA–7576/MPS–23A and radar signals to various inputs of

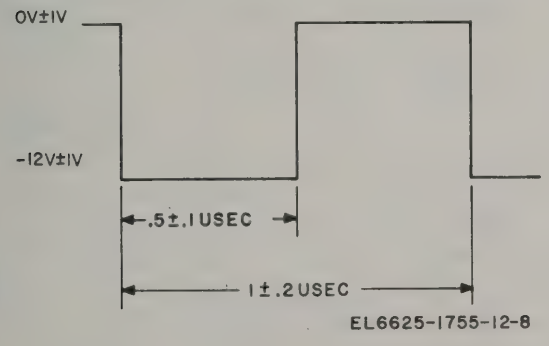

Figure 3–5. Waveform for assembly 10764.

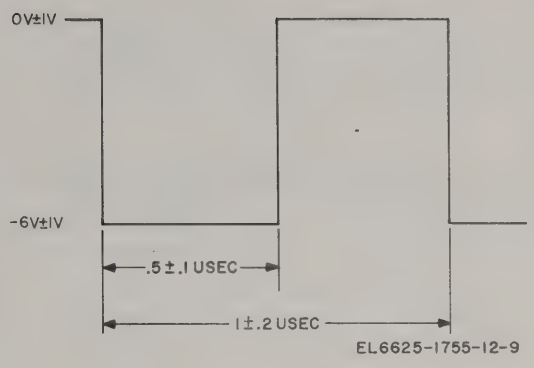

Figure 3–6. Waveform assembly 10763.

video selector assembly 10748. A five-position rotary switch on the test set simulates control panel and GO/NO-GO switch functions, for example, ftc, dicke-fix, test.

a. Turn the OSCP SYNC switch to 3MS +.

b. Plug video selector assembly 10748 into test set 10748 connector.

c. Set the POWER switch to ON.

d. Turn the five-position rotary switch (below 10748 connector) to 1.

e. Monitor TP5 with the oscilloscope.

f. Check to see that the waveform is as shown in –1, figure 3–7.

g. Turn the five-position switch (below 10748 connector) to 2.

h. Check to see that the waveform is as shown in –1, figure 3–7.

i. Turn the five-position switch (below 10748 connector) to 3.

j. Check to see that the waveform is the same as that shown in –2, figure 3–7.

k. Turn the five-position switch (below 10748 connector) to 4.

l. Check to see that the waveform is as shown in –3, figure 3–7. If necessary adjust R7 of 10748 to obtain a –6 ±1–volt reading.

m. Turn the five-position switch (below 10748 connector) to 5.

n. Check to see that the waveform is as shown in –3, figure 3–7. If necessary, adjust R17 of 10748 to obtain this waveform.

3–13. Video Gate Assembly 10757 Test

The test set applies simulated radar and OA–7576/MPS–23A synthetic video signals to vid-

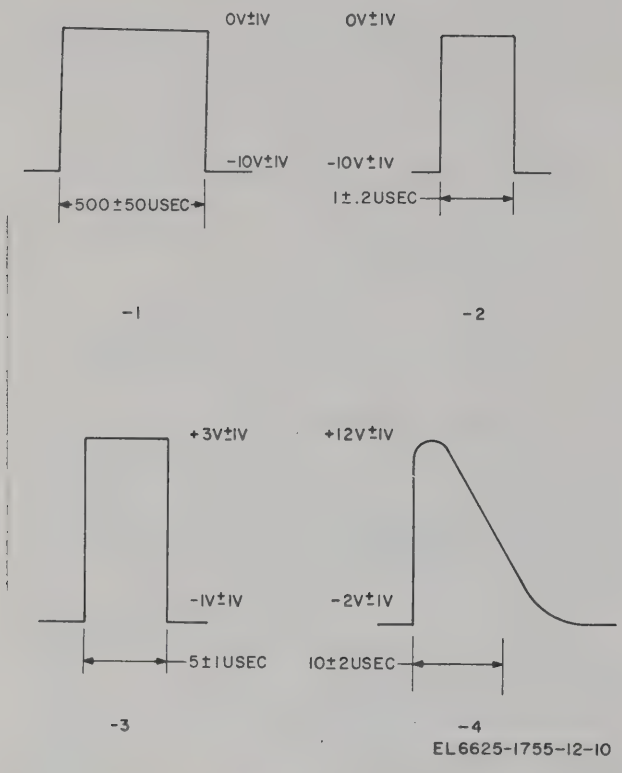

Figure 3-7. Waveform for assembly 10748.

eo gate assembly 10757. The test panel switches simulate the control panel and the PRSD functions.

a. Turn the OSCP SYNC switch to 3MS +.

b. Plug video gate assembly 10575 into the test set 10757 connector.

c. Set the POWER switch to ON.

d. Set the ON-OFF switch (below 10757 connector) to off.

e. Set the OP-$\overline{OP}$ switch to $\overline{OP}$.

f. With the oscilloscope, monitor TP5 of 10757 and check to see that the waveform is as shown in –1, figure 3–8.

g. Set the ON-OFF switch (below 10757 connector) to ON.

h. Check to see that the waveform is as shown in –2, figure 3–8.

i. Set the OP-$\overline{OP}$ switch to OP.

j. Check to see that the waveform is as shown in –1, figure 3–8.

k. Set the ON-OFF switch (below 10757 connector) to OFF and check to see that the waveform is as shown in –1, figure 3–8.

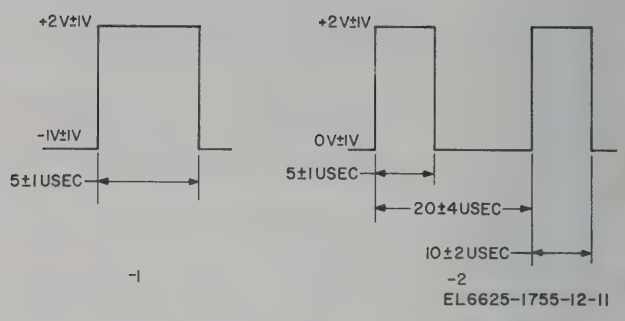

Figure 3-8. Waveform for assembly 10757.

3–14. Anti-Wildcat Assembly 10749 Test

The test set simulates video and wildcatting signals to anti-wildcat assembly 10749.

a. Turn the OSCP SYNC switch to 3MS +.

b. Plug anti-wildcat assembly 10749 into test set connector 10749.

c. Set the POWER switch to ON.

d. Set the ON-OFF switch (below 10749 connector) to OFF.

e. With the oscilloscope, monitor TP3 of assembly 10749 and observe a +3 ±1-volt level.

f. Monitor TP5 of 10749. Adjust R14 of assembly 10749 until a negative-going 1 ±0.1 volts, 10 microseconds (usec) ±1 is observed.

g. Monitor TP7 of assembly 10749 and observe a ground level.

h. Monitor TP9 of assembly 10749 for waveform as shown in figure 3–9. If necessary, adjust R26 of assembly 10749 until the waveform shown in figure 3–9 is obtained.

i. Set the ON-OFF switch (below 10749 connector) to ON.

j. Check to see that the waveform obtained in *h* above becomes a ground level.

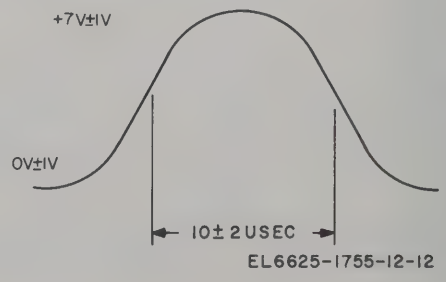

Figure 3-9. Waveform for assembly 10749.

3–15. Test Target Assembly 10752 Test

The test set applies simulated signals to test target assembly 10752 to check circuits which generate the test target used in aligning the OA-7576/MPS-23A analog system, and the strobe pulse used by the delay lines.

a. Turn the OSCP SYNC switch to DL.

b. Plug Extender Circuit Card MX–8258/MPM–56 into the test set 10752 connector.

c. Plug test target assembly 10752 into the extender board.

d. Set the POWER switch to ON.

e. Monitor pin 7 on the extender board with the oscilloscope.

f. Check to see that the waveform is as shown in –1, figure 3–10.

g. Turn the OSCP SYNC switch to 3 MS +.

h. Monitor TP7 of assembly 10752 for a waveform as shown in –2, figure 3–10.

i. Monitor TP11 of assembly 10752 for a waveform same as shown in –2, figure 3–10.

j. Monitor TP6 of assembly for a waveform as shown in –3, figure 3–10.

k. Monitor TP1 of assembly 10752 for a waveform as shown in –4, figure 3–10. Adjust R11 of assembly 10752 as necessary to obtain desired voltages for S1 switch position 10752 (–4, fig. 3–10).

l. Turn S1 of assembly 10752 to 7.

m. Set S2 of assembly 10752 to OFF.

n. Set the ON-OFF switch (below 10752 connector) to OFF.

o. Monitor pin 23 on the extender board for a 0 ±1-volt waveform.

p. Set S2 of assembly 10752 to ON.

q. Monitor pin 23 on the extender board for a waveform as shown in –4, figure 3–10 for position 7 of S2 of assembly 10752.

r. Set S2 of assembly 10752 to OFF.

s. Set the ON-OFF switch (below 10752 connector) to ON.

t. Monitor pin 23 on the extender board for a 0 ±1-volt waveform.

u. Set S2 of assembly 10752 to ON.

v. Monitor pin 23 on the extender board for a 0 ±1-volt waveform.

w. Set S2 of assembly 10752 to OFF.

x. Set the ON-OFF switch (below 10752 connector) to OFF.

y. Monitor pin 25 of the extender board for a 0 ±1-volt waveform.

z. Set S2 of assembly 10752 to ON.

aa. Monitor pin 25 of the extender board for a –12 ±-volt waveform.

3–16. Diode Gate Assembly 10761 Test

The test set simulates OA–7576/MPS–23A signals to 14 diode gates in parallel on diode gate assembly 10761. Pull-up resistors are included within the test set to simulate OA–7576/MPS–23A gate resistors.

a. Turn the OSCP SYNC switch to 3MS +.

b. Plug extender Circuit Card MX–8258/MPM–56 into the test set 10761 connector.

c. Plug diode gate assembly 10761 into the extender board.

d. Set the POWER switch to ON.

e. Monitor pins 2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38 and 41 on the extender board with the oscilloscope.

f. Check to see that waveforms for each pin monitored are as shown in figure 3–11.

3–17. Peak Detector Assembly 10750 Test

The test set provides simulated OA–7576/MPS–23A video signals to peak detector assembly 10750. Three different input levels, can be chosen by a rotary switch on the test set front panel.

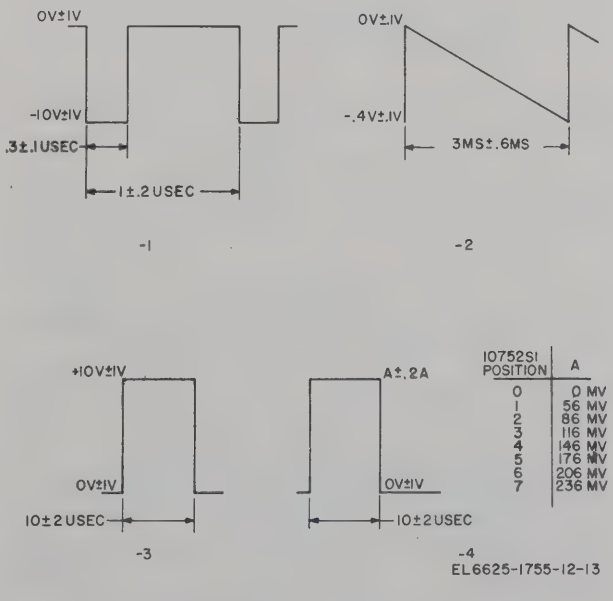

Figure 3–10. Waveform for assembly 10752.

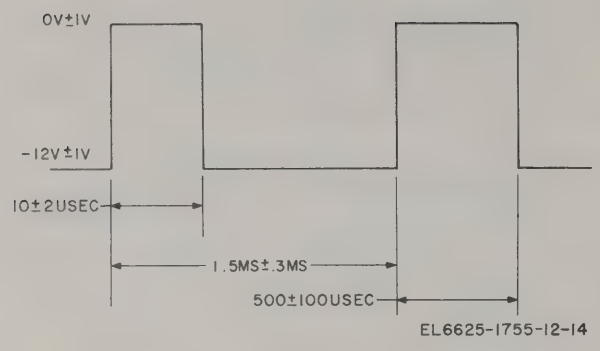

Figure 3–11. Waveform for assembly 10761.

a. Plug peak detector assembly 10750 into the test set 10750 connector.

b. Set the POWER switch to ON.

c. Turn the three-position rotary switch (below 10750 connector) to 1.

d. Monitor TP1 of assembly 10750 with the oscilloscope.

e. Check for a 1-volt waveform as shown in figure 3–12.

f. Turn the three-position rotary switch to 4.

g. Check for a –4-volt waveform similar to that shown in figure 3–12.

h. Turn the three-position rotary switch to 7.

i. Check for a –7-volt waveform similar to that shown in figure 3–12.

3–18. Height-to-Width Converter Assembly 10751 Test

Height-to-width converter assembly 10751 is tested in conjunction with peak detector assembly 10750. The two assemblies are interconnected the same way as they are in the OA–7576/MPS–23A.

a. Turn the OSCP SYNC switch to 3MS +.

b. Plug height-to-width converter assembly 10751 into the test set 10751 connector.

c. Plug peak detector assembly 10750 into the test set 10750 connector.

d. Set the POWER switch to ON.

e. Turn the three-position rotary switch (below in 10750 connector to 1).

f. Monitor TP4 of assembly 10751 with the oscilloscope.

g. Check to see that the waveform is as shown in figure 3–13 with a pulse width of 0.5 usec.

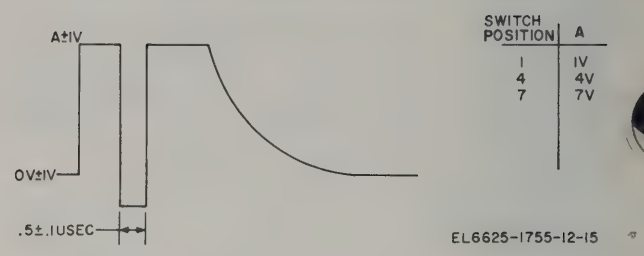

Figure 3–12. Waveform for assembly 10750.

h. Turn the three-position rotary switch to 4.

i. Check to see that the waveform is as shown in figure 3–13, with a pulse width of 2.0 usec.

j. Turn the three-position rotary switch to 7.

k. Check to see that the waveform is as shown in figure 3–13 with a pulse width of 3.5 usec.

l. If necessary, adjust R9 and/or R17 on assembly 10751 to obtain the above waveforms.

SWITCH POSITION	W
1	0.5 USEC
4	2.0 USEC
7	3.5 USEC

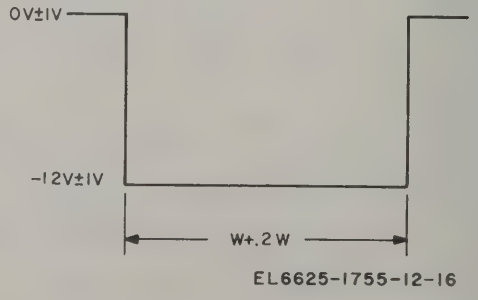

Figure 3–13. Waveform for assembly 10751.

3–19. A/D Converter Assembly 10753 Test

The test set crystal-controlled oscillator, which is identical with one contained in the OA-7576/MPS-23A, is applied to A/D converter assembly 10753. Adjustment of the output clock pulses used throughout the OA–7576/MPS–23A can be performed.

a. Turn the OSCP SYNC switch to DL.

b. Plug A/D Converter Assembly 10753 into the test set 10753 connector.

c. Set the POWER switch to ON.

d. Monitor TP5 of assembly 10753 with the oscilloscope.

e. Check to see that the waveform is as shown in –1, figure 3–14. If necessary, adjust R43 of assembly 10753 to obtain this waveform.

f. Monitor TP9 of assembly 10753.

g. Check to see that the waveform is same as that shown in figure 3–14. If necessary, adjust R18 of assembly 10753 to obtain this waveform.

h. Monitor TP7 of assembly 10753.

i. Check to see that the waveform is as shown in –2, figure 3–14. If necessary, adjust R15 of assembly 10753 and/or R39 of assembly 10753 to obtain this waveform.

j. Set the GRD switch (below 10753 connector) to the center position.

k. Monitor TP8 of assembly 10753.

l. Check to see that the waveform is same as that shown in –2, figure 3–14.

m. Set the GRD switch to the up position and observe a ground level.

n. Set the GRD switch to the down position and observe a ground level.

o. Monitor TP6 of assembly 10753.

p. Check to see that a direct current (dc) level of either ground or –12 volts is observed.

q. Set the GRD switch to the up position.

r. Check to see that a dc level of either ground or –12 volts is observed.

s. Set the GRD switch to the center position.

t. Check to see that the waveform is as shown in –3, figure 3–14.

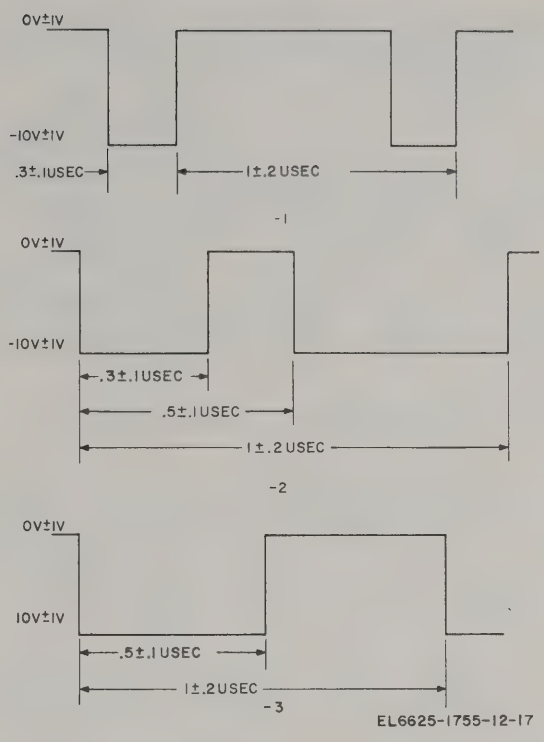

Figure 3–14. Waveform for assembly 10753.

3–20. GO/NO-GO No. 1 Assembly 10758 Test

The test set simulates either a OA–7576/MPS-23A *GO* or *NO-GO* condition to the GO/NO-GO No. 1 assembly 10758, and the output can be monitored.

a. Plug the extender board into the test set 10758 connector.

b. Plug GO/NO-GO No. 1 assembly 10758 into the extender board.

c. Set the POWER switch to ON.

d. Monitor Pin 18 on the extender board with the oscilloscope.

e. Check to see that the waveform is as shown in –1, in figure 3–15.

f. Set the GRD/–12V switch to the center position.

g. Turn the eight-position rotary switch (below 10758 connector) to 1.

h. Monitor pin 23 on the extender board.

i. Check to see that the waveform is as shown in –2, figure 3–15. If necessary, adjust R26 of 10758 to obtain desired waveform.

j. Turn the eight-position rotary switch

through positions 2 through 8; check each time to see that the waveform is as shown in –2, figure 3–15.

k. Set the GRD/-12V switch to –12V.

l. Turn the eight-position rotary switch through positions 1 through 8, and observe at each position a ground level on the oscilloscope.

m. Set the GRD/-12V switch to GRD.

n. Turn eight-position rotary switch through positions 1 through 8, and observe at each position a ground level on the oscilloscope.

3–21. GO/NO-GO No. 2 Assembly 10759 Test

The test set simulates *GO* pulses to the inputs of GO/NO-GO No. 2 assembly 10759. An internal meter of the test set is controlled to simulate the OA-7576/MPS-23A GO/NO-GO meter.

a. Turn the OSCP SYNC switch to DL.

b. Plug Extender, Circuit Card MX-8258/MPM-56 into the test set 10759 connector.

c. Plug GO/NO-GO No. 2 assembly 10759 into the extender board.

d. Set the POWER switch to ON.

e. Monitor pin 2 on the extender board with the oscilloscope.

f. Check to see that the waveform is as shown in figure 3–16. If necessary, adjust R6 of assembly 10759 to obtain desired waveform.

g. Turn the METER switch to 10759.

h. Adjust the MTR ADJ control (below 10759 connector) until the TEST INDICATOR meter reads in the PASS area.

3–22. GO/NO-GO No. 3 Assembly 10760 Test

The test set simulates OA-7576/MPS–23A *GO* pulses to GO/NO-GO No. 3 assembly

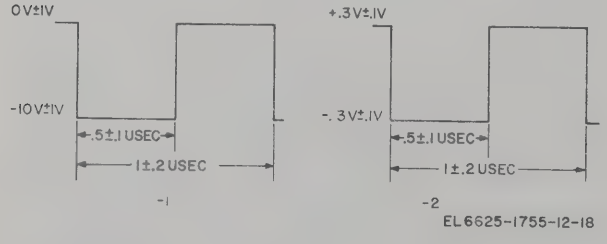

Figure 3–15. Waveform for assembly 10758.

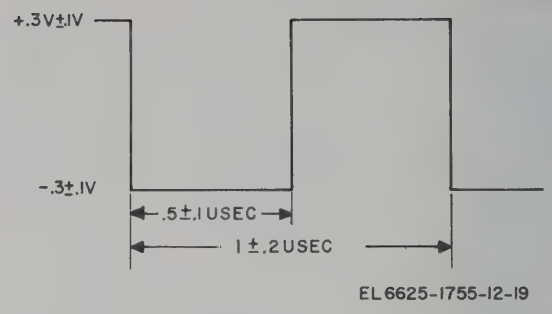

Figure 3–16. Waveform for assembly 10759.

10760. The various outputs can then be monitored.

a. Turn the OSCP SYNC switch to 3MS +.

b. Plug Extender, Circuit Card MX–8258/MPM–56 into the test set 10760 connector.

c. Plug GO/NO-GO No. 3 assembly into the extender board.

d. Set the POWER switch to ON.

e. Monitor pin 10 on the extender board with the oscilloscope.

f. Check to see that the waveform is as shown in –1, figure 3–17(1). If necessary, adjust R19 of assembly 10760 to obtain –2 ±1 volts.

g. Monitor pin 13 on the extender board.

h. Check to see that the waveform is the same as that shown in –2, figure 3–17(1). If necessary, adjust R12 of 10760 to obtain +2 ±1 volts.

i. Monitor pin 28 on the extender board.

j. Check that waveform is same as shown in –1, figure 3–17(1). If necessary, adjust R30 of assembly 10760 to obtain –2 ±1 volts.

k. Monitor pin 11 on the extender board.

l. Check to see that the waveform is as shown in –3, figure 3–17(1). If necessary, adjust R10 of assembly 10760 to obtain –1 ±0.5 volts.

m. Monitor pin 26 on the extender board.

n. Check to see that the waveform is the same as that shown in –4, figure 3–17(1). If necessary, adjust R20 of assembly 10760 to obtain –1 ±0.5 volts.

o. Monitor pin 40 on the extender board.

p. Check to see that the waveform is the

same as that shown in –5, figure 3–17(2). If necessary, adjust R36 of assembly 10760 to obtain –1 ±5 volts.

q. Monitor pin 39 on the extender board.

r. Check to see that the waveform is as shown in –6, figure 3–17(2).

s. Monitor pin 36 on the extender board.

t. Check to see that the waveform is as shown in –7, figure 3–17(2). If necessary, adjust R27 of assembly 10760 to obtain 6 ±1 volts.

u. Monitor pin 37 on the extender board.

v. Check to see that the waveform is the same as that shown in –8, figure 3–17(2). If necessary, adjust R29 of assembly 10760 to obtain +6 ±1 volts.

3–23. Interface Assembly 10755 Test

The test set simulates radar and OA–7576/MPS–23A signals to interface assembly 10755.

a. Turn the OSCP SYNC switch to 3MS +.

b. Plug Extender, Circuit Card MX–8258/MPM–56 into the test set 10755 connector.

c. Plug interface assembly 10755 into the extender board.

d. Set the POWER switch to ON.

e. Set the HOLD-$\overline{\text{HOLD}}$ switch to $\overline{\text{HOLD}}$.

f. Monitor pin 9 on the extender board with the oscilloscope.

g. Check to see that the waveform is as shown in –1, figure 3–18. If necessary, adjust R84 of assembly 10755 for +28 ±1 volts.

h. Monitor pin 11 on the extender board.

i. Check to see that the waveform is the same as that shown in –2, figure 3–18. If necessary, adjust R18 of assembly 10755 for 28 ±1 volts.

j. Monitor pin 37 on the extender board.

k. Check to see that the waveform is the same as that shown in –3, figure 3–18. If necessary, adjust R92 of assembly 10755 for +28 ±1 volts.

l. Set the HOLD-$\overline{\text{HOLD}}$ switch to HOLD.

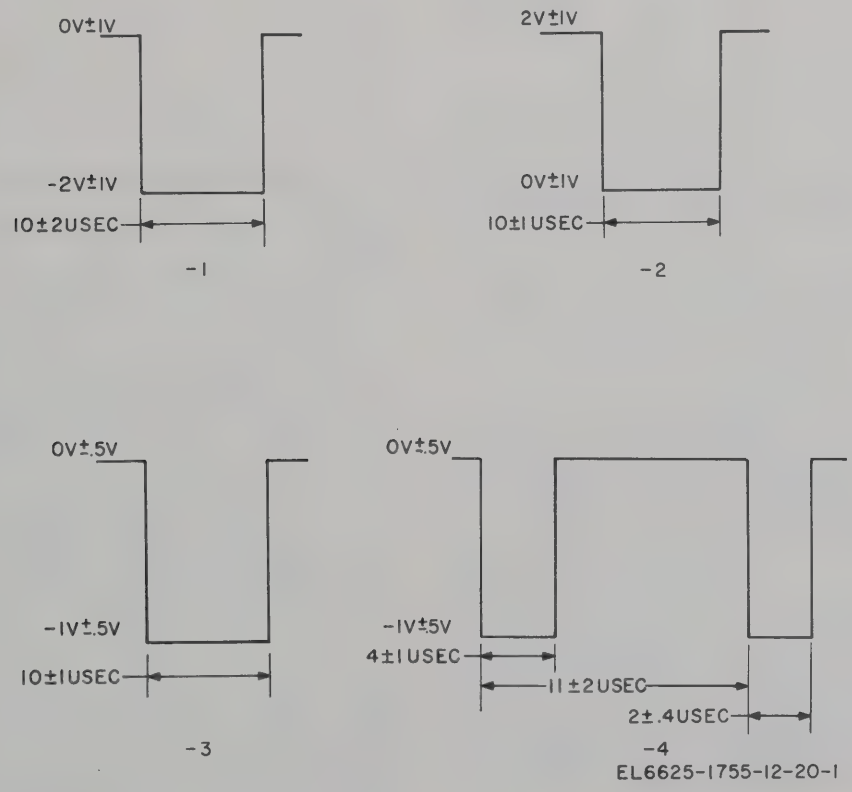

Figure 3–17(1). Waveform for assembly 10760 (part 1 of 2).

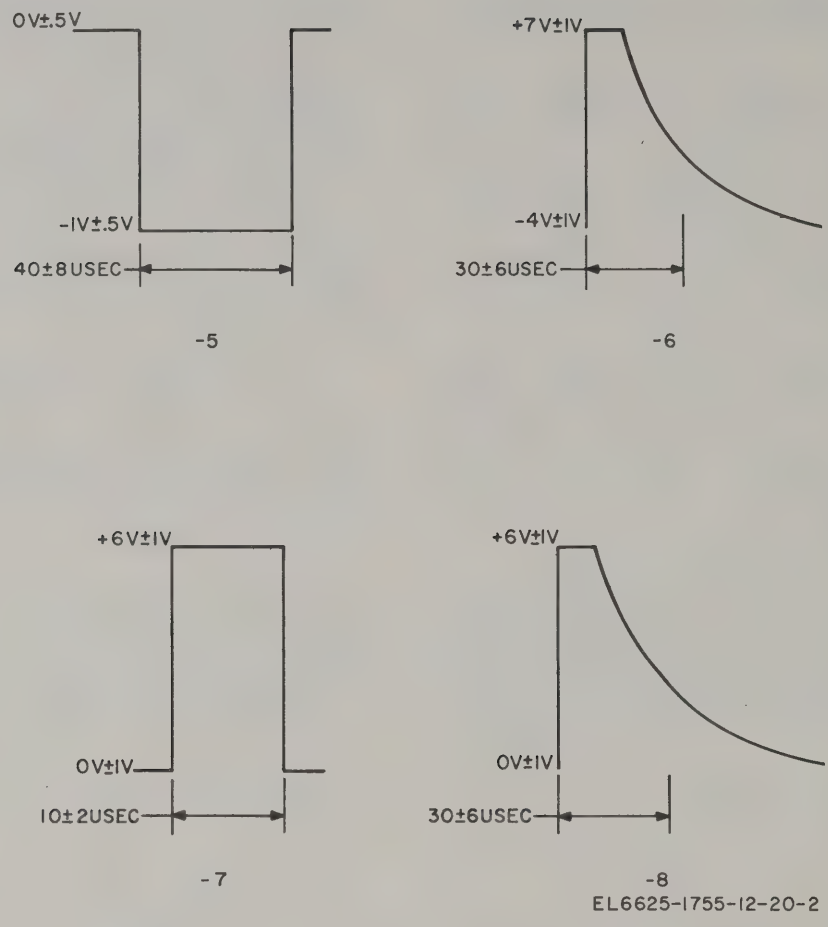

Figure 3–17(2). Waveform for assembly 10760 **(part 2 of 2).**

m. Check to see that the waveform is a ground level.

n. Monitor pin 41 on the extender board.

o. Check to see that the waveform is –10 ±1-volt level. If necessary, adjust R84 of assembly 10755.

p. Set the HOLD-$\overline{\text{HOLD}}$ switch to $\overline{\text{HOLD}}$.

q. Check to see that the waveform is as shown in –4, figure 3–18.

r. Monitor pin 43 on the extender board.

s. Check to see that the waveform is the same as that shown in –4, figure 3–18. If necessary, adjust R81 of assembly 10755 to obtain –10±1 volts.

t. Set the HOLD-$\overline{\text{HOLD}}$ switch to HOLD.

u. Check to see that the waveform is a ground level.

v. Monitor pin 1 on the extender board.

w. Check to see that the waveform is as shown in –4, figure 3–18.

x. Monitor pin 2 on the extender board.

y. Check to see that the waveform is the same as that shown in –4, figure 3–18.

z. Monitor pin 35 on the extender board.

aa. Check to see that the waveform is as shown in –5, figure 3–18. If necessary, adjust R11 of assembly 10755 and/or R30 of assembly 10755 to obtain this waveform.

ab. Monitor pin 13 on the extender board.

ac. Adjust R44 of assembly 10755 to obtain a level of +6 ±1 volts.

3–24. Interface Relay Assembly 10756 Test

The test set internal circuitry ascertains correct operation of the relays by simulating radar and OA–7576/MPS–23A signals to interface relay assembly 10756.

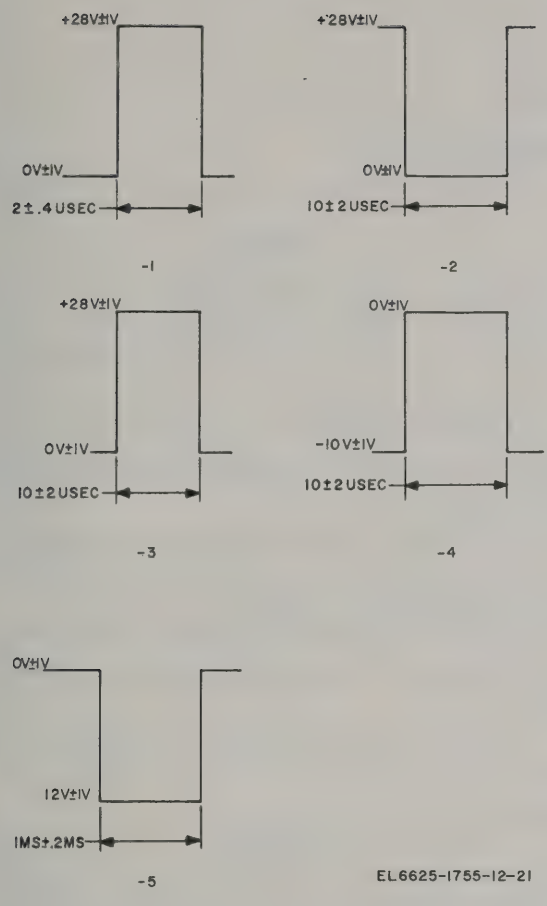

Figure 3–18. Waveform for assembly 10755.

a. Plug Extender, Circuit Card MX–8258/MPM–56 into the test set connector.

b. Plug interface relay assembly 10756 into the extender board.

c. Set the POWER switch to ON.

d. Set the ON-OFF switch (below 10756 connector) to OFF.

e. Monitor pins 10, 29, 35 and 41 on the extender board with the oscilloscope.

f. Check to see that a ground level is indicated on the oscilloscope for each pin monitored.

g. Monitor pins 3, 6, 9, 11, 15, 18, 22, 25, 28, 30, 34, 36, 30 and 42 on the extender board.

h. Check to see that a +12-volt level is observed on the oscilloscope for each pin monitored.

i. Set the ON-OFF switch (below 10756 connector) to ON.

j. Monitor pins 11, 30, 36 and 42 on the extender board.

k. Check to see that a ground level is indicated on the oscilloscope for each pin monitored.

l. Monitor pins 10, 29, 35, and 41 on the extender board.

m. Check to see that a +12-volt level is observed on the oscilloscope for each pin monitored.

n. Monitor pins 3, 6, 9, 15, 18, 22, 25, 28, 34 and 40 on the extender board.

o. Check that a –12-volt level is observed for each pin monitored.

3–25. Output Generator Assembly 11001 Test

The test set simulates conditions necessary to test output generator assembly 11001 controls. The test set is used to simulate corresponding functions on the front panel of the SG-630/MPS-23A.

a. Set the OSCP SYNC switch to 3MS +.

b. Plug output generator assembly 11001 into the test set 11001 connector.

c. Set the POWER switch to ON.

d. Monitor TP11 of assembly 11001.

e. Check to see that the waveform is as shown in –1, figure 3–19.

f. Turn the oscilloscope SYNC switch to INT.

g. Monitor TP5 of assembly 11001.

h. Set the AUTO-MAN. switch to MAN.

i. Check to see that the waveform pulse occurs one time as shown in –2, figure 3–19.

j. Monitor TP7 of assembly 11001.

k. Check to see that the waveform is as shown in –3, figure 3–19.

3–26. Flip-Flop Assembly 10762 Test

Two different types of tests are accomplished on flip-flop assembly 10762. In the first test, all flip-flops are alternately set and reset. In the second test, six flip-flops are interconnected as a binary counter.

a. Turn the OSCP SYNC switch to DL.

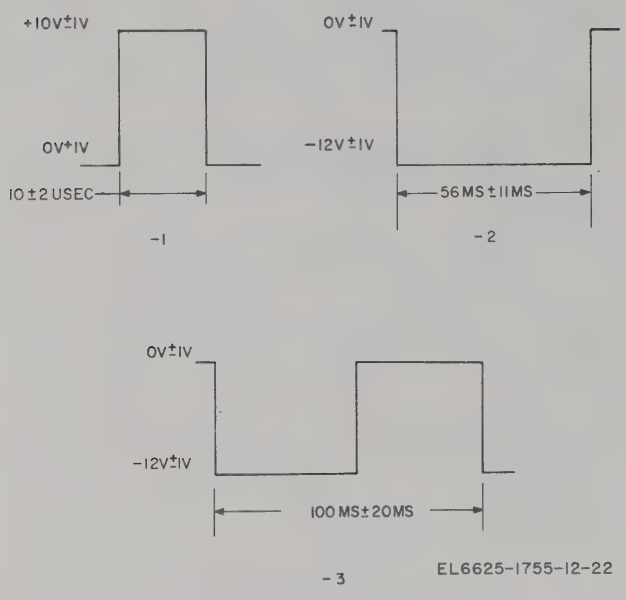

Figure 3–19. Waveform for assembly 11001.

b. Plug flip-flop assembly 10762 into the test set 10762-1 connector.

c. Set the power switch to ON.

d. Monitor TP1, 3, 5, 7, 9 and 11 on assembly 10762.

e. Check to see that the waveforms are as shown in –1, figure 3–20 for each test point.

f. Set the POWER switch to OFF.

g. Remove flip-flop assembly 10762 from the 10762–1 connector and replug assembly 10762 into the 10762–1 connector.

h. Set the POWER switch to ON.

i. Monitor TP1, 3, 5, 7, 9 and 11 on assembly 10762.

j. Check to see that the waveforms for each pin monitored correspond to the waveforms shown in –2, figure 3–20.

3–27. NAND Gate Assembly 10870 Test

All ten NAND gates are tested at the same

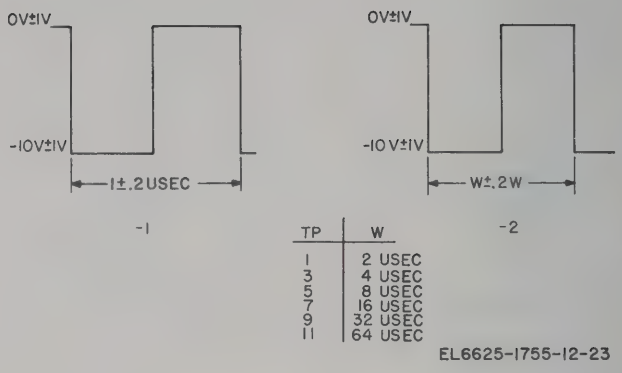

Figure 3–20. Waveform for assembly 10762.

time by applying simulated OA–7576/MPS–23A signals.

a. Set the OSCP SYNC switch to 3MS +.

b. Plug NAND gate assembly 10870 into the test set 10870 connector.

c. Set the POWER switch to ON.

d. Monitor TP1 through TP10 on assembly 10870.

e. Check to see that each waveform is as shown in figure 3–21.

3–28. Stopping Procedures

a. To return the test set to a nonoperating condition, set the POWER switch to OFF.

b. To completely shut down the equipment, remove the power cable plug on the front panel of the test set from the 115-volt ac power source.

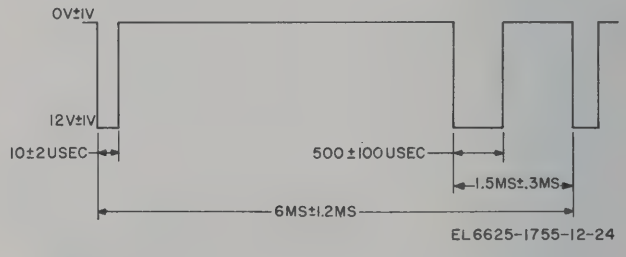

Figure 3–21. Waveform for assembly 10870.

CHAPTER 4
MAINTENANCE INSTRUCTIONS

4–1. Scope of Maintenance

The maintenance duties assigned to the operator of Test Set, Radar AN/MPM–56 are listed below together with a reference to the paragraphs covering the specific maintenance function. These duties do not require special tools. Multimeter TS–352B/U is used for continuity checks.

a. Preventive maintenance (paras 4–2–4–6).

b. Cleaning (para 4–7).

c. Touchup painting instructions (para 4–8).

d. Troubleshooting (paras 4–9, 4–10, and 4–11).

e. Repairs (para 4–12).

4–2. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, reduce downtime, and assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 4–3 through 4–8 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts outline functions to be performed at specific intervals. These checks and services are to maintain the test set in good general (physical) condition. Also provided are electrical checks within the scope of organizational maintenance. If a defect is encountered and cannot be corrected by use of the supporting information in this chapter, a higher category of maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38–750.

4–3. Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services of the test set are required daily, weekly, and monthly. Paragraph 4–4 specifies checks and services that must be accomplished daily, and paragraphs 4–5 and 4–6 specify additional checks and services that must be performed on a weekly and quarterly basis, respectively.

4–4. Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
		Warning: **Prolonged breathing of cleaning compound is dangerous; make sure adequate ventilation is provided. Cleaning compound is flammable; DO NOT use near a flame. Avoid contact with the skin; wash off any that spills on the hands.**	
1	Cleanliness	Clean exterior of equipment. Use a dry clean, lint-free cloth to remove dust, fungus, and dirt. If necessary, moisten cloth with cleaning compound.	Para 4–7.
2	Controls	Check rotary and toggle switches for proper action. Check to see that control knobs are tight on shafts and do not bind or rub against panel.	None.
3	Cables	Check ac power cord and interconnection cables for	None.

Sequence No.	Item to be inspected	Procedure	References
		cuts, cracks, and breaks. Repair any cuts in cable insulation by first covering them with rubber tape and then with friction tape. Replace a broken power cord or cable.	

4–5. Weekly Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	Case and exposed metal surfaces.	Inspect for corrosion and moisture. Clean and/or touch up.	Paras 4–7 and 4–8.
2	Latches and slip hinges.	Check for smoothness of operation	Fig. 1–1.
3	Switches, knobs, connectors, fuses, and panel lamp.	Check for security and operation	Fig. 3–1.
4	TEST INDICATOR meter.	Check for damaged glass. Clean meter window	Fig. 3–1, para 4–7.
5	Extender board	Check for corrosion or damage	Fig. 1–2.

4–6. Monthly Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	Cables	Check and replace or repair cables having cuts, cracks or breaks.	Fig. 1–2.
2	Control knobs	Tighten control knobs; replace knobs if setscrews cannot be tightened, or if knobs are chipped or broken.	Fig. 3–1.
3	Toggle and rotary switches.	Check tightness of mounting hardware and action of switches.	Fig. 3–1.
4	Connectors	Check condition of connectors for evidence of broken or corroded terminals.	Fig. 3–1. Para 3–6.
5	TEST INDICATOR meter.	Check condition of TEST INDICATOR meter for normal operation (perform procedures given in paragraph 3–6).	
6	Modifications	Check DA Pam 310–7 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All NORMAL MWO's must be scheduled.	DA Pam 310–7.

4–7. Cleaning

The exterior surfaces of the test set should be free of dust, dirt, grease, and fungus.

a. Remove dust and loose dirt with a clean, soft cloth.

Warning: **Prolonged breathing of cleaning compound is dangerous; make sure adequate ventilation is provided. Cleaning compound is flammable; DO NOT use near a flame. Avoid contact with the skin; wash off any that spills on the hands.**

b. Remove grease, fungus, and ground-in dirt from the test set and the case cover. Use a cloth dampened (not wet) with Cleaning Compound (Federal stock No. 7930–395–9542).

c. Remove dust or dirt from plugs and jack with a brush.

Caution: **Do not press on the meter face (glass) when cleaning; the meter may become damaged.**

d. Clean the front panel, the TEST INDICATOR meter, and the control knobs; use a soft, clean cloth. If dirt is difficult to remove, dampen the cloth with water; use mild soap if necessary and dry thoroughly.

4–8. Touchup Painting Instructions

Remove rust and corrosion from metal surfaces

by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices specified in TM 9–213 and TB SIG 364.

4–9. Troubleshooting

Organizational troubleshooting of the test set is based on the operational checks given in the monthly preventive maintenance checks and services chart, or failure of a known good subassembly to pass its test procedure. Visual inspection procedures for troubleshooting are given in paragraph 4–10, and the troubleshooting chart is given in paragraph 4–11.

4–10. Visual Inspection

When the equipment fails to perform properly, turn off the power and check the items listed below. *Do not check any item with the power on.*

a. Wrong settings of switches and controls (para 3–4–3–27).

b. Power cord, interconnecting cables, or extender board disconnected or poorly connected.

c. Burned-out front panel fuses or power supply fuses.

4–11. Troubleshooting Chart

Use Multimeter TS–352B/U for checking continuity.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	No input voltage, and pilot lamp does not light.	*a.* Defective pilot lamp	*a.* Replace pilot lamp.
		b. Defective ON-OFF switch	*b.* Check continuity of switch. If defective, return test set to higher category maintenance.
		c. Blown input fuses	*c.* Check fuses; replace if necessary.
		d. Power cord not connected properly.	*d.* Check to see that connector is securely plugged into mating socket.
2	TEST INDICATOR meter pointer fails to move, or operates erratically.	*a.* Loose connections to TEST INDICATOR meter.	*a.* Check connections; repair if necessary.
		b. Defective TEST INDICATOR meter.	*b.* Return test set to higher category maintenance.
3	Subassemblies known to be operating accurately do not meet operational performance standards when tested.	*a.* Test set front panel connectors or terminals loose or defective.	*a.* Check condition of connectors and terminals. Check to see that connectors are properly connected.
		b. Internal circuitry of test set requires adjustment or repair.	*b.* Return test set to higher category maintenance.

4–12. Repairs

a. Replacement of Panel Lamp.

(1) Remove the panel lamp lens.

(2) Pull the defective lamp out and replace it with new lamp (MS25252 NE–2D). Push the lamp in; twist the lamp clockwise to lock.

(3) Reinstall the lamp lens.

b. Replacement of Panel Fuses.

(1) Extract the fuse knob from the fuseholder with the fuse intact within the knob.

(2) Remove the fuse from the cap.

(3) Reinstall the cap and the new fuse; twist clockwise to lock.

CHAPTER 5

SHIPMENT AND LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

5–1. Disassembly of Test Set, Radar AN/MPM–56

a. Set the POWER switch to OFF.

b. Remove the ac power cord plug from the power source.

c. Remove any external equipment connected by cables to the test set.

5–2. Repackaging for Shipment or Limited Storage

The procedure for repacking depends on the material available. Adapt the procedures outlined below whenever circumstances permit.

a. Place the test set in a suitable carton and pack padding or shredded paper fairly tight around all sides of the test set so that the contents cannot shift.

b. Close the carton and seal it with waterproof tape; be sure to seal all openings of the carton.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

5–3. Authority for Demolition

The demolition given in paragraph 5–4 will be used to prevent the enemy from using or salvaging this equipment. Demolition will be accomplished only upon order of the commander.

5–4. Methods of Destruction

Use any of the methods given below to destroy the test set.

a. Smash. Smash the case, meters, knobs, and switches; use sledges, axes, handaxes or crowbars.

Warning: **Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.**

b. Cut. Cut the cables; use axes.

c. Burn. Burn the technical manuals; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

d. Explode. Place a grenade or other explosive device inside the case, or destroy the interior with firearms.

e. Dispose. Bury or scatter the destroyed parts in slit trenches or foxholes, or throw them into streams.

APPENDIX A

REFERENCES

The following is a list of applicable references available to organizational repairman of the test set.

DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310–7	U. S. Army Equipment Index of Modification Work Orders.
TB SIG 364	Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 9–213	Painting Instructions for Field Use.
TM 38–750	Army Equipment Record Procedures.

APPENDIX B

BASIC ISSUE ITEMS

Section I. INTRODUCTION

B–1. Scope

This appendix lists items conprising an operable equipment and those required for installation, operation, or operator's maintenance for Test Set, Radar AN/MPM–56.

B–2. Explanation of Columns

The following is a list of explanations of columns in section II.

a. Source, Maintenance, and Recoverability Codes (SMR) Column.

(1) *Source code (S).* The selection status and source for the listed item is the first code indicated in this column. The source code used and its explanation is:

Code	Explanation
P	Applies to repair parts that are stocked in or supplied from GSA/DSA, or Army Supply system, and authorized for use at indicated categories.

(2) *Maintenance code (M).* The lowest category of maintenance authorized to install the item is indicated by the second code in the column. The maintenance category code and its explanation is:

Code	Explanation
C	Operator/Crew

(3) *Recoverability code (R).* Not used.

Note. When no code is indicated in the recoverability column, the part will be considered expendable.

b. Federal Stock Number Column. This column indicates the Federal stock number for the item.

c. Description Column. This column includes the Federal item name and any additional description of the item which may be required. A part number or other reference number is followed by the applicable five-digit Federal Supply Code for Manufacturers. Usable on code column is not used.

d. Unit of Measure Column. The unit used as a basic of measure (e.g., ea, pr, ft, yd, etc). is given in this column.

e. Quantity Incorporated in Unit Column. The total quantity of the item used in the equipment is given in this column.

f. Quantity Furnished with Equipment Column. This column lists the quantity of the item supplied for initial operation of the equipment and/or the quantities authorized to be kept on hand by the operator for maintenance of the equipment.

g. Illustrations Column.

(1) *Figure number (a).* The number of the illustration on which the item is shown is indicated in this column.

(2) *Item No. or reference designation (b).* The reference designation and/or item number callout used to reference the item on the illustration appears in this column.

SECTION II BASIC ISSUE ITEMS

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION Reference Number & Mfr Code — USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) QTY FURN WITH EQUIP	(7) ILLUSTRATIONS (a) FIG. NO.	(7) ILLUSTRATIONS (b) ITEM NO. OR REFERENCE DESIGNATION
	6625-105-8341	TEST SET, RADAR AN/MPM-56 (This item is nonexpendable)				1-1	
		TECHNICAL MANUAL 11-6625-1755-12	ea	1	1		
		Requisition through pinpoint account number if assigned; otherwise through nearest Adjutant General facility.					
		A quantity of one technical manual is packed with each equipment. Where a valid need exists, additional copies may be requisitioned and kept on hand.					
-C	6625-106-7899	TEST SET, RADAR TS-2780/MPM-56	ea	1	1	1-1	
-C	6625-105-8342	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-11834/MPM-56	ea	1	1	1-2	W1
-C	6625-105-8343	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-11835/MPM-56	ea	1	1	1-2	W4
-C	6625-105-8344	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-11836/MPM-56	ea	1	1	1-2	W5
-C	6625-105-8345	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-11837/MPM-56	ea	1	1	1-2	W6
-C		CABLE ASSEMBLY, RADIOFREQUENCY CG-1464B/U (2 ft. 2 in.)	ea	1	1	1-2	W7
-C		CABLE ASSEMBLY, RADIOFREQUENCY CG-1464B/U (1 ft. 2 in.)	ea	2	2	1-2	W2, W3
P-C		CRYSTAL: SM-B-374216; 80063	ea	1	1		
-C	6625-107-4460	EXTENDER, CIRCUIT CARD MX-8258/MPM-56	ea	1	1	1-2	
P-C	5920-089-3858	FUSE: F01A125V1A; 96906	ea	1	5		
P-C	5920-912-9375	FUSE: F01A125V2A; 96906	ea	1	5		
P-C	6240-802-4420	LAMP, NEON: MS25252-NE2D; 96906	ea	1	1		
P-C		RELAY: SM-B-443626; 80063	ea	1	1		
		NO ACCESSORIES, TOOLS, OR TEST EQUIPMENT ARE TO BE ISSUED WITH THIS EQUIPMENT					
		NO BASIC ISSUE ITEMS ARE MOUNTED IN OR ON THE EQUIPMENT					

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for Test Set, Radar AN/MPM-56. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Explanation of Format for Maintenance Allocation Chart

a. Group Number. Group numbers correspond to the reference designation prefix assigned in accordance with ASA Y32.16, Electrical and Electronics Reference Designations. They indicate the relation of listed items to the next higher assembly.

b. Component Assembly Nomenclature. This column lists the item names of component units, assemblies, subassemblies, and modules on which maintenance is authorized.

c. Maintenance Function. This column indicates the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

Code	Maintenance Category
C	Operator/Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance
D	Depot Maintenance

d. Tools and Equipment. The numbers appearing in this column refer to specific tools and equipment which are identified by these numbers in section III.

e. Remarks. Self explanatory.

C-3. Explanation of Format for Tool and Test Equipment Requirements

The columns in the tool and test equipment requirements chart are as follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool for maintenance function.

b. Maintenance Category. The codes in this column indicate the maintenance category normally allocated the facility.

c. Nomenclature. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number.

e. Tool Number. Not used

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1	TEST SET, RADAR AN/MPM-56	C O												
			O H D										1 1 thru 7 1 thru 7	
				C O										
					O H								6 6 1 thru 7	
							H						1 thru 7	
								C						
									O H				1 thru 7	
										H D			1 thru 7 1 thru 7	
											D		1 thru 7	
												D	1 thru 7	

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		AN/MPM-56 (contd.)		
1	O,H,D	MULTIMETER TS-352/U	6625-242-5023	
2	H,D	OSCILLOSCOPE AN/USM-81	6625-701-4038	
3	H,D	PREAMPLIFIER AM-1839/USM	6625-701-4037	
4	H,D	PREAMPLIFIER AM-1841/USM	6625-679-6509	
5	H,D	TEST SET, TRANSISTOR TS-1836/U	6625-893-2628	
6	O,H,D	TOOL KIT TK-100/G	5180-605-0079	
7	O,H,D	TOOLS AND TEST EQUIPMENT NORMALLY AVAILABLE TO THE MAINTENANCE TECHNICIAN BECAUSE OF HIS ASSIGNED FUNCTION.		

APPENDIX D

ORGANIZATIONAL REPAIR PARTS

Section I. INTRODUCTION

D–1. Scope

This appendix contains a list of repair parts required for the performance of organizational maintenance for Test Set, Radar AN/MPM–56.

Note. No special tools, test, and support equipment are required.

D–2. General

The repair parts list is divided into the following sections:

a. Prescribed Load Allowance (PLA), Section II. The PLA is a consolidated listing of repair parts allocated for initial stockage at the organizational maintenance category. This is a mandatory minimum stockage allowance.

b. Repair Parts for Organizational Maintenance, Section III. Repair parts authorized for organizational maintenance are included in this section.

Note. All indexes noted below are cross referenced to index numbers. The index numbers appear in ascending sequence in column 1 of the repair parts list (para D–3*a*). The index number for the particular item will be the same for the item in all sections of this appendix.

c. Federal Stock Number Cross Reference to Index Number, Section IV. This is a cross reference index of Federal stock numbers to index numbers.

d. Figure and Item Number Cross Reference to Index Number, Section V. This is a cross reference index of figure number and item number (or reference designation) to index number. The figure numbers are listed in numerical sequence; item numbers and/or reference designations are listed for each figure.

e. Reference Designation Cross Reference to Index Number, Section VI. This is a cross reference index of reference designation to index number.

D–3. Explanation of Columns

An explanation of the columns is given below.

a. Source, Maintenance, and Recoverability Codes (SMR) and Index Numbers Column. The first line in this column lists the applicable SMR codes for the part. Listed in ascending order directly below the SMR codes is the index number assigned to the repair part.

(1) *Source code (S).* The selection status and source for the listed item is noted here. Source code and its explanation is as follows:

Code	Explanation
P	Applies to repair parts that are stocked in or supplied from the DSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.

(2) *Maintenance code (M).* The lowest category of maintenance authorized to install the listed item is noted here.

Code	Explanation
O	Organizational Maintenance

(3) *Recoverability code (R).* Not used.

Note. When no code is indicated in the recoverability column, the part will be considered expendable.

b. Federal Stock Number Column. The Federal stock number for the item is listed in this column.

c. Description Column. This column includes the Federal item name and any additional description of the item required, the

manufacturer's part number (reference number), and the applicable five-digit Federal Supply Code for Manufacturers (para D–5). Usable on code column is not used.

d. Unit of Measure Column. The unit used as a basis of measure (e.g., ea, pr, ft, yd, etc.) is indicated in this column.

e. Quantity Incorporated in Unit Column. The quantity of repair parts in an assembly is given in this column.

f. Maintenance Allowances Column.

(1) The maintenance allowance column is divided into subcolumns. Indicated in each subcolumn opposite the item is the total quantity of items authorized for the number of equipments supported.

(2) The quantitative allowances for organizational category of maintenance represents one initial prescribed load for a 15-day period for the number of equipments supported. Units and organizations authorized additional prescribed loads will multiply the number of prescribed loads authorized by the quantity of repair parts reflected in the appropriate density column to obtain the total quantity of repair parts authorized.

(3) Subsequent changes to organizational allowances will be limited as follows: No change in the range of items is authorized. If additional items are considered necessary, recommendations should be forwarded to Commanding General, U. S. Army Electronics Command, ATTN: AMSEL–ME–NMP–RR, Fort Monmouth, N.J. 07703, for exception or revision to the allowance list. Revisions to the range of items authorized will be made by the USA ECOM National Maintenance Point based upon engineering experience, demand data, or TAERS information.

g. Illustrations Column.

(1) *Figure number (a).* The number of the illustration in which the item is shown is indicated in this column.

(2) *Item No. or reference designation (b).* The reference designation used to reference the item in the illustration appears in this column.

D–4. Location of Repair Parts

a. This appendix contains three cross-reference indexes (secs. IV, V, and VI), to be used to locate a repair part when either the Federal stock number, figure number, or reference designation is known. The first column in each cross-reference index is prepared, as applicable, in numerical or alphanumerical sequence. The last column of each cross-reference index lists the index number assigned to the part.

b. Refer to the appropriate cross-reference index (paras D–2*c, d, e,*) and note the index number in the last column; then refer to the repair parts list to locate the index number which is listed in ascending order in column 1 of the repair parts list.

D–5. Federal Supply Codes

This paragraph lists the Federal supply code and the associated manufacturer's name.

Code	Manufacturer's Name
80063	Army Electronics Command
96906	Military Standards

SECTION II PRESCRIBED LOAD ALLOWANCE

(1) FEDERAL STOCK NUMBER	(2) DESCRIPTION / USABLE ON CODE	(3) 15-DAY ORG. MAINT. ALLOWANCE (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100
5355-850-8128	KNOB: MS91528-1P2B; 96906	1	2	4	5
5920-089-3858	FUSE, CARTRIDGE: F01A125V1A; 96906	2	3	5	10
5920-912-9375	FUSE, CARTRIDGE: F01A125V2A; 96906	2	3	5	10
6240-892-4420	LAMP, NEON: MS25252-NE2D; 96906	1	2	3	5

(1) SMR CODE / INDEX NO.	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION Reference Number & Mfr Code / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATIONS (a) FIG NO.	(b) ITEM NO. OR REFERENCE DESIGNATION
A001	6625-105-8341	TEST SET, RADAR AN/MPM-56 (This item is nonexpendable)								
P-O A002	5920-912-9375	FUSE, CARTRIDGE: F01A125V2A; 96906	ea	1	2	3	5	10	3-1	F2
P-O A003	5920-089-3858	FUSE, CARTRIDGE: F01A125V1A; 96906	ea	1	2	3	5	10	3-1	F1
P-O A004	5355-850-8128	KNOB: MS91528-1P2B; 96906	ea	6	1	2	4	5	3-1	MP(6)
P-O A005	6240-892-4420	LAMP, NEON: MS25252-NE2D; 96906	ea	1	1	2	3	5	3-1	DS1

SECTION IV. INDEX-FEDERAL STOCK NUMBER CROSS REFERENCE TO INDEX NUMBER

FEDERAL STOCK NUMBER	INDEX NO.	FEDERAL STOCK NUMBER	INDEX NO.	FEDERAL STOCK NUMBER	INDEX NO.
5355-850-8128	A004				
5920-089-3858	A003				
5920-912-9375	A002				
6240-892-4420	A005				
6625-105-8341	A001				

SECTION V INDEX-FIGURE AND ITEM NUMBER CROSS REFERENCE TO INDEX NUMBER

FIG. NO.	ITEM NO. OR REFERENCE DESIGNATION	INDEX NO.
3-1	DS-1	A005
	F1	A003
	F2	A002
	MP(6)	A004

FIG. NO.	ITEM NO. OR REFERENCE DESIGNATION	INDEX NO.

SECTION VI INDEX-REFERENCE DESIGNATION CROSS REFERENCE TO INDEX NUMBER

REFERENCE DESIGNATION	INDEX NO.	REFERENCE DESIGNATION	INDEX NO.	REFERENCE DESIGNATION	INDEX NO.
DS-1	A005				
F1	A003				
F2	A002				
MP(6)	A004				

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By Order of the Secretary of the Army:

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ARNG: None.

USAR: None.

For explanation of abbreviations used, see AR 320–50.

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